

Date: Wed, 2 Nov 94 04:30:34 PST  
From: Ham-Homebrew Mailing List and Newsgroup <ham-homebrew@ucsd.edu>  
Errors-To: Ham-Homebrew-Errors@UCSD.Edu  
Reply-To: Ham-Homebrew@UCSD.Edu  
Precedence: List  
Subject: Ham-Homebrew Digest V94 #323  
To: Ham-Homebrew

Ham-Homebrew Digest                      Wed, 2 Nov 94                      Volume 94 : Issue 323

Today's Topics:

                                FM Crystal Set  
            HELP: Duroid anybody have rogers' number?  
                                Help on ARK4  
                                Local Radio Jammer?  
            Need mail-order source for MC2831A chip  
                                Need phone# of crystal mfr's  
            Program for desining low pass filters  
                                QRP transmittor circuit q  
            VCR Tuner Module for Prog. Weather Recvr. Mods?  
                                Where does the power go?

Send Replies or notes for publication to: <Ham-Homebrew@UCSD.Edu>  
Send subscription requests to: <Ham-Homebrew-REQUEST@UCSD.Edu>  
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Homebrew Digest are available  
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-homebrew".

We trust that readers are intelligent enough to realize that all text  
herein consists of personal comments and does not represent the official  
policies or positions of any party. Your mileage may vary. So there.

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Date: 1 Nov 1994 22:45:11 GMT  
From: ian.mitchell@research.utas.edu.au (Ian Mitchell)  
Subject: FM Crystal Set

Hello,

Here is a circuit for an FM crystal set which appeared in a small  
book entitled "Modern Crystal and Transistor Set Circuits for Beginners"  
published in 1973 by B.B. Babani, London. I picked it up in '76 while on  
holiday in England.

Germanium Diode eg 0A91  
| /|



>--

>Lance Lascari WS2B <lascal@rpi.edu> Senior EE @ Rensselaer Polytechnic Inst.  
>Mount Greylock Expeditionairy Farce Secret agent #52,342

Try Roger's Marketing/Advertising Coordinator Julie Burchett at (602)961 1382

One of our grad students encountered someone from Rogers at a conference a couple of years ago and was told that Rogers will supply small quantities of Duroid free to University researchers in exchange for copies of papers involving Duroid applications.

Roy Schmaus                                      Email schmaus@bode.ee.ualberta.ca  
Room 442 Civil/Electrical Engineering Bldg.  
University of Alberta                              (403) 492-4118/2354  
Edmonton, Alberta                                      fax (403) 492-1811

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Date: Tue, 1 Nov 1994 22:09:47 EST  
From: Tun Hung <TXH112@psuvm.psu.edu>  
Subject: Help on ARK4

Hi:

Does anyone has the experiences building ARK4- the synthesized 40 meter kit from S & S Engineering? It looks pretty good from the brochure and I would like to know more about it before I buy one. Any help would be appreciated

Tun    N30CZ

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Date: Fri, 28 Oct 1994 23:10:29 GMT  
From: abergsma@doe.carleton.ca (A.J. Bergsma)  
Subject: Local Radio Jammer?

fill in stuff on the jamming needs

go to a department store that sells kids toys and look for the microphones for kids that transmit to the radio....  
they are usually FM and are really cheap <\$5 sometimes.  
tune it to the offending station at home and when you get to work, just turn it on....(reference the 'capture effect' from previous)  
the range is usually @ 5-10 metres max but then just non-chalantly place it behind the guys radio.....

have fun!

aj

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Date: Fri, 28 Oct 1994 23:04:52 GMT  
From: abergsma@doe.carleton.ca (A.J. Bergsma)  
Subject: Need mail-order source for MC2831A chip

Jeff Duntemann (jeffd@coriolis.com) wrote:  
: A friend and I have been playing with some FM transmitter designs  
: using Motorola's MC2831A IC. We used to get them from DC Electronics  
: here in Scottsdale but DC doesn't have them anymore. If anyone  
: knows of a reasonably reliable mail-order source for this chip,  
: please clue us in.

: Thanks much.

: --Jeff Duntemann KG7JF  
: jeffd@coriolis.com

Electrosonic has them...however, they may be out of stock because  
supposedly the motorola plant had some major problems...(fire???)  
and most rf chips are slow in coming...so i've been told by a  
distributor....any ways, try them....if you can't find an address,  
get a hold of me direct...

Electrosonic: in Ottawa, Toronto, Vancouver for sure  
throughout the states as well

aj

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Date: Tue, 1 Nov 1994 17:31:39 GMT  
From: dgf@netcom.com (David Feldman)  
Subject: Need phone# of crystal mfr's

I know this was discussed recently, but I need phone number(s) for outfit  
to make custom crystal, such as JAN, International Crystal, etc.; it's  
been a long time since I have had xtals made, and I've forgotten who the  
vendors are and where they are located.

73 Dave WB0GAZ dgf@netcom.com

-----  
Date: 1 Nov 1994 16:54:55 GMT  
From: ignacy@misz.animal.uiuc.edu (Ignacy Misztal)  
Subject: Program for desining low pass filters

I am looking for formula or at best a PD program to design low pass elliptic filters. I am also looking for help with filters that have all inductances the same.

Ignacy Misztal	Ham radio: N09E, SP8FWB
E-mail: ignacy@uiuc.edu	
University Of Illinois	1207 W. Gregory Dr., Urbana, IL 61801, USA
tel. (217) 244-3164	Fax: (217) 333-8286

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Date: Wed, 2 Nov 94 05:51:00 -0400  
From: hua.chu@channel1.com (Hua Chu)  
Subject: QRP transmittor circuit q

MA>on

MA>This is a QRP Transmitter question:

MA>How come some circuit designs have the 'Final' transistor connected  
MA>directly to the output filter and on to the antenna,

MA>but sometimes

MA>the output of the final transistor is sent to a coil, which then has  
MA>another coiling wrapped over it, and that then goes to the output filter  
MA>and antenna?

That's called an RF 'transformer'. It's a device used to match the impedences of the two circuits.

MA>Is one better than the other? The direct method is certainly easier -  
The engineer who designed it would say so, but others would differ. 8>).

-H

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\* OLY 2.1 \* It's only a hobby ... only a hobby ... only a

-----  
Date: Tue, 1 Nov 1994 09:39:43  
From: mulveyk@kahu.lincoln.ac.nz (Mulvey, Ken)  
Subject: VCR Tuner Module for Prog. Weather Recvr. Mods?

Anyone out there who may have converted or adapted a VHF/UHF  
VCR tuner Module into a 136 - 138 Mhz weather satellite  
receiver. Problems of IF??? TIA. Ken

-----  
Date: 02 Nov 1994 04:13:00 GMT  
From: wk@muscle.frc.maf.govt.nz (Wilbert Knol)  
Subject: Where does the power go?

In article <1994Oct29.133204.9660@ke4zv.atl.ga.us> gary@ke4zv.atl.ga.us (Gary  
Coffman) writes:

```
>          Z1
>  -----/\ /\ /\ /\ -x-----
>  |                                           |
>  |                                           \
>  (V)                                           / Z2
>  |                                           \
>  |-----x-----|
>
```

> For ease of illustration, I'm going to assign Z1 and Z2 to be 1 ohm  
> each, and set V equal to 2 volts. This is a "matched" situation with  
> 1 ampere of current flowing, and 1 watt of power being dissipated in  
> each of Z1 and Z2. If we change Z2 to 0.5 ohm, then we have 1 1/3  
> amperes of current flowing in the loop, Z1 has a voltage drop of  
> 1 1/3 volts, and Z2 has a voltage drop of 2/3 volt. That gives a  
> power dissipation at the load of 8/9 watt, and in the source of  
> 1 7/9 watts. If instead we make Z2 equal 2 ohms, then we have a  
> loop current of 2/3 amp, and voltage drops at Z1 of 2/3 volt and  
> at Z2 of 1 1/3 volt. That gives a power dissipation at the source  
> of 8/9 watt and at the load of 1 1/3 watts.

This is a nice and easy way to model a transmitter.

In fact, in the 3rd case (Z2 = 2), a voltage drop of 2/3 V across Z1  
at a current of 2/3 A will cause a dissipation at the source of 1 1/3  
W. The load will drop 4/3 V and thus dissipate 8/9 W.

> To sum up, for the matched case we have an efficiency of 50%.

- > In the case of the 0.5 ohm load the efficiency is 32%. And in
- > the case of the 2 ohm load the efficiency is 60%.

The figures are:

Z2	Psource	Pz1	Pz2	Efficiency
0.5	2.67 W	1.78 W	0.89 W	33.33 %
1	2.00 W	1.00 W	1.00 W	50.00 %
2	1.33 W	0.44 W	0.89 W	66.67 %

- > So it appears
- > that our amplifier efficiency improves when the internal impedance
- > is smaller than the load impedance, \*not\* identical as in the matched
- > case. This has real implications for us because we know that large
- > signal RF amplifiers with efficiencies greater than 50% exist, and
- > are in common use every day at transmitter sites all over the world.
- > We can safely conclude that these transmitters do not have matched
- > real impedances in source and load.

I agree, to extract the maximum amount of power from our transmitter, the load should be equal to the impedance of the transmitter. However, dissipation in the transmitter would be quite high, and the efficiency would be no more than 50 %.

In practice, solid state transmitters are built with a much lower driving impedance than the 50 ohms they are designed to work into. This reduces the dissipation and makes it more efficient. To protect the transmitter from RF power hungry hams, overload protection is put in, shutting down the transmitter when the load drops below the recommended 50 ohms.

Wilbert, ZL2BSJ.

--

Wilbert Knol, Acoustics Group, MAF Marine Research, Wellington, New Zealand.  
 Usenet: wk@frc.maf.govt.nz PACKET:ZL2BSJ@ZL2WA.NZL.OC  
 AMPR:[44.147.180.88] AX25 NET/ROM TCP/IP MBX 146.625 147.075 MHz 24 hrs.

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 Date: 1 Nov 1994 22:18:53 GMT  
 From: Philip Peake <philip@wv.mentorg.com>

References<38rro9\$p6e@elaine.teleport.com\*  
<19940ct30.045752.13121@ke4zv.atl.ga.us>, <39164j\$ohr@elaine.teleport.com>  
Subject: Re: THE LITTLE RAZOR BLADE RADIO (UPDATE)

> In article <19940ct30.045752.13121@ke4zv.atl.ga.us\*,  
> Gary Coffman <gary@ke4zv.atl.ga.us\* wrote:  
> \*In article <38rro9\$p6e@elaine.teleport.com\*burt@teleport.com (Burt Keeble)  
writes:  
> \*\*  
> \*\* I have determined that any piece of carbon steel will serve as  
> \*\* a collector. Ordinary ferrous materials will not. The  
> \*\* literature says that regular razor blades work better than blue  
> \*\* blades.  
> \*  
> \*The reason high carbon steel is needed is that it's the ferric carbides  
> \*that act as the semiconductor. These are distributed in domains in the  
> \*steel, so you have to hunt for a sensitive spot with your cat's whisker  
> \*to get best response.  
> \*  
>  
> So far, the only sources of high carbon steel that I have found are  
> cutting implements (razor blades, carving blades, etc....). I would  
> like a source that isn't potentially dangerous.

Maybe someone already said this ... but ... have you tried galena  
(sp ??), which is a lead sulphide crystal, also known as fool's gold ?

It was the basis of the detector in many early crystal sets.  
Chunks of it are available in most "nature" shops, or anywhere else  
that sells interesting minerals.

Clamp it on one side, and use a "cat's whisker" to lightly touch it.  
You ay need to move it around for best sensitivity.

Philip

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Date: Sat, 29 Oct 1994 17:30:08 GMT  
From: gary@ke4zv.atl.ga.us (Gary Coffman)

References<9409247830.AA783016585@mails.imed.com>  
<19940ct25.153307.2220@ke4zv.atl.ga.us>, <19940ct25.204901.20098@arrl.org>  
Reply-To: gary@ke4zv.atl.ga.us (Gary Coffman)  
Subject: Re: Where does the power go?

In article <19940ct25.204901.20098@arrl.org> zlau@arrl.org (Zack Lau (KH6CP))  
writes:



>  
>One characteristic of a real resistor is that it gets hot (generates  
>heat). In fact, a common technique for measuring actual power  
>is to measure how much energy is given off as heat.  
>  
>Thus, being familiar with amplifiers that generate much more heat  
>when putting out RF power than when warming up the filaments, I'd  
>conclude that there is real resistance. This is why most linear  
>amplifiers have such low efficiencies--there is in fact a resistive  
>element that heats up. You can increase the efficiency by driving  
>the amplifier so that the tubes act more like switches than  
>resistors, but you lose linearity (splatter all over the band  
>with SSB--poor amateur practice).

Class AB1 amplifiers routinely achieve 65% efficiency from DC input  
to RF output in VHF TV broadcast service. Tubes certainly aren't  
100% efficient, but that's not because of some output impedance  
resistor. It's because of contact resistance, back bombardment,  
and plain old  $I^2R$  losses in the tube structure. Every attempt  
is made to minimize these losses. Tube contact surfaces are silver  
plated, and made large, tube structure lengths are minimized, and  
suppressor grids are used in some cases. Flowing 12 amps at 8 kV  
can cause a tube, and cavity, to heat, but not 48 kW worth.

Gary

--

Gary Coffman KE4ZV		You make it,		gatech!wa4mei!ke4zv!gary
Destructive Testing Systems		we break it.		emory!kd4nc!ke4zv!gary
534 Shannon Way		Guaranteed!		gary@ke4zv.atl.ga.us
Lawrenceville, GA 30244				

-----  
Date: 31 Oct 1994 17:31:38 GMT  
From: Cecil\_A\_Moore@ccm.ch.intel.com

References<9409267832.AA783201194@mails.imed.com> <38orrj\$sodi@chnews.intel.com>,  
<38qp6u\$utn@info2.rus.uni-stuttgart.de>  
Subject: Re: Where does the power go? Part 2

In article <38qp6u\$utn@info2.rus.uni-stuttgart.de>,  
<moritz@ipers1.e-technik.uni-stuttgart.de> wrote:

>  
>... we all know that forward power readings change under mismatch.

Hi Moritz, I think we all know that forward power readings change  
under mismatch \_when we are using an antenna tuner\_ but the question  
was do the forward power readings change when we are using the "50

ohm" output from a transmitter into 50 ohm coax. I think the consensus is that the output impedance of an ordinary 100w transmitter is considerably below 50 ohms but greater than zero and, no doubt, complex.

--

73, Cecil, KG7BK, 00TC (All my own personal fuzzy logic, not Intel's)

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Date: 1 Nov 1994 09:13:27 -0800  
From: burt@teleport.com (Burt Keeble)

References<39164j\$ohr@elaine.teleport.com>  
<19940ct31.001225.19727@ke4zv.atl.ga.us>, <kludgeCyK1p5.95D@netcom.com>  
Subject: Re: THE LITTLE RAZOR BLADE RADIO (UPDATE)

In article <kludgeCyK1p5.95D@netcom.com>,  
Scott Dorsey <kludge@netcom.com> wrote:  
\*In article <19940ct31.001225.19727@ke4zv.atl.ga.us> gary@ke4zv.atl.ga.us (Gary Coffman) writes:

\*>  
\*>Chain saw bars, cold chisels, files, etc are all high carbon steel.  
\*  
\*Cast iron isn't high carbon steel, but works well for a steel detector  
\*anyway if you can get a polished section. Still, I always had better  
\*luck with copper oxide detectors myself (and copper oxide is everywhere,  
\*unfortunately).  
\*--scott

Well, how do I make a copper oxide detector? Maybe that would be a better component?

-burt  
--

"We are all descended from a long line of determined, resourceful, microscopic tadpoles--champions every one." K.V.

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Date: Wed, 2 Nov 1994 17:07:24 +8  
From: bodafu@ccvax.sinica.edu.tw (David L. Bergart)

References<19940ct30.045752.13121@ke4zv.atl.ga.us>  
<39164j\$ohr@elaine.teleport.com>, <396esd\$ib0@hpbab.wv.mentorg.COM>  
Subject: Re: THE LITTLE RAZOR BLADE RADIO (UPDATE)

Fools gold is iron pyrite, not lead sulfide. You want to use lead sulfide for

your detector. You can make it by mixing lead filings and sulfur powder. Put the mixture in a short length of 1/4 inch copper tube and then torch it till the powders melt.

DO THIS OUTSIDE, please, burning sulfur and lead fumes are no joke. Make sure that both ends of the tube are open to prevent released gases from blowing MOLTEN STUFF FROM HELL into your face.

WEAR EYE PROTECTION

When it cools, break it and bed a piece in a blob of solder.

David

\_\_\_\_D\_\_a\_\_v\_\_i\_\_d\_\_\_\_B\_\_e\_\_r\_\_g\_\_a\_\_r\_\_t\_\_\_\_\_  
bodafu@ccvax.sinica.edu.tw

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Date: Tue, 1 Nov 1994 17:37:08 GMT  
From: jbbloom@arrl.org (Jon Bloom (KE3Z))

References<38orrj\$sodi@chnews.intel.com> <38qp6u\$utn@info2.rus.uni-stuttgart.de>,  
<3939lq\$a1l@chnews.intel.com>  
Subject: Re: Where does the power go? Part 2

Cecil\_A\_Moore@ccm.ch.intel.com wrote:

[snip]

: ohm" output from a transmitter into 50 ohm coax. I think the consensus  
: is that the output impedance of an ordinary 100w transmitter is  
: considerably below 50 ohms but greater than zero and, no doubt, complex.

In an earlier post you said that with a properly tuned antenna tuner in line, a conjugate match would be achieved. (I'm paraphrasing, but I think that's accurate.) Presumably, the impedance looking into the antenna tuner is 50 ohms. If the output impedance of the transmitter is not 50 ohms, how is there a conjugate match? (Hint: there isn't.)

--

Jon Bloom KE3Z    jbbloom@arrl.org

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End of Ham-Homebrew Digest V94 #323

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